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March 8, 1995

By Hand

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554

Re: Local Multipoint Distribution Service
CC Docket No. 92-297, Ex Parte Presentation

Dear Mr. Caton:

The enclosed Reply Comments prepared by CellularVision confirm the Commission's prior conclusions that the 28 GHz band is the appropriate spectrum for the nationwide licensing of the Local Multipoint Distribution Service ("LMDS"). The Reply Comments also detail why exiling LMDS to the 40.5-42.5 GHz ("40 GHz") band would kill this innovative technology in its infancy, and rebut the flawed assertions of some parties who seek to create the impression that the differences between LMDS at 28 GHz and 40 GHz would be insignificant.

CellularVision filed the enclosed Reply Comments on March 1, 1995 in Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, ET Docket No. 94-124, RM-8308 (released November 8, 1994). Since CellularVision's Reply Comments contain information which is relevant to the above-referenced proceeding, enclosed are two (2) copies of the Reply Comments which we request be associated with the above-referenced proceeding.

Finally, we reiterate our request that the Commission promptly reactivate this proceeding, since, as documented in our filings, the nationwide deployment of LMDS in the 28 GHz band will bring numerous immediate benefits to the public.

Please direct any questions regarding this matter to the undersigned.

Sincerely,

Michael R. Gardner
Counsel for CellularVision

Enclosures
cc Attached Service List

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications	)	ET Docket No. 94-124 RM-8308

REPLY COMMENTS OF CELLULARVISION

CELLULARVISION

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March 1, 1995

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SUMMARY

When the 40 GHz Rulemaking was initially launched by the Commission, it was commenced without any mention of the relocation of LMDS to the 40 GHz band as the Commission already had a well-developed eight-year record of support for licensing LMDS nationwide through robust use of the largely fallow 28 GHz band.

Clearly in retrospect, the Commission was manipulated at the outset by committing its very limited and overtaxed resources to a proceeding which has become the modern-day Trojan Horse for the well-connected deep-pocketed FSS interests, led by Hughes and Teledesic, who simply wish to advance their dual anti-competitive goals: (1) to hoard exclusive access to the enormously valuable yet unused 28 GHz spectrum for possible FSS use in the future, and to do so free of any spectrum auction requirements; and (2) to bury the proven technically and economically feasible LMDS, which could immediately provide vigorous competitive alternative services to cable, Hughes's DBS service and other incumbent video, voice and data providers.

While the Commission inexplicably has ignored its obligation and prior commitment to allow the long-stalled 28 GHz Rulemaking to move forward with yet-to-be filed public interest comments by educational, non-profit and consumer groups — who along with the Clinton Administration's SBA strongly endorse the licensing of LMDS only in the workable 28 GHz band — the Commission now has been inundated with a chorus of unsupported and often misleading filings from the well-coordinated and well-financed FSS industry claiming that LMDS would be viable in the 40 GHz band.

While it is indeed curious why the Commission would allow the 40 GHz Rulemaking to become an inappropriate substitute for the stalled LMDS 28 GHz Rulemaking, the record now before it confirms that the 40 GHz is not suitable for the nationwide deployment of LMDS. It simply will not work, and that is a view that oddly is confirmed by the FSS's main stalking horse, the CEPT, which recommended that the 40 GHz be used in their countries for a limited capacity (20 channels "typical"), limited coverage video service, "MVDS," that has yet to be realized. Due to the severe propagation constraints at 40 GHz, the CEPT-envisioned MVDS is yet to be proven as suitable for deployment in limited areas of Northern Europe where "drizzle" dominates the climate. Not

surprisingly, despite all of the FSS histrionics and hyperbole, even CEPT and U.K. documents confirm that 40 GHz MVDS could not compete with cable and 150 + channel DBS systems. Those documents also confirm the limited and questionable use of the 40 GHz — spectrum that simply will not allow LMDS to become the competitive video and telephony alternative — a fact already recognized by officials throughout the Western Hemisphere. In Canada, Mexico, Brazil, Argentina, Venezuela, Guatemala and other parts of the world, LMDS is already licensed in the 28 GHz and moving ahead.

It is time for the Hundt Commission to stop allowing its processes to be manipulated and its focus distracted by the untested FSS paper proposals of Hughes and Teledesic; the overwhelming public interest benefits from the prompt nationwide deployment of LMDS in the 28 GHz are simply too important and too numerous to justify further delay.

Enormous spectrum auction revenues for the Federal Treasury, jobs — especially in the beleaguered defense industry, educational advances — particularly through LMDS distance learning, affordable voice and video technologies for all consumers, with probable ownership of LMDS systems by women, minorities and small businesses, and the promise of continued U.S. leadership in the global communications marketplace through the proven application of 28 GHz LMDS in this country — these are the real issues before the Commission.

Let the FSS interests continue to use the vast 100-plus GHz of spectrum that the FCC has already deeded to them, yet mandate that they embrace the numerous co-frequency sharing techniques recommended by Bellcore and other industry leaders that make possible LMDS and FSS co-primary use of the 28 GHz band. Alternatively, if the FSS interests refuse co-frequency sharing of the 28 GHz band with LMDS, the Commission should move the proposed FSS paper systems to the bands above 40 GHz, where the U.S. military's operational MILSTAR system demonstrates FSS viability in those bands. The Commission must not allow the vacant FSS filings and their empty "win-win" rhetoric in the 40 GHz Rulemaking to further delay LMDS's robust nationwide use of the 28 GHz — the spectrum that the Commission has already formally labelled "the most suitable frequency band available" for LMDS.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications	)	ET Docket No. 94-124 RM-8308

REPLY COMMENTS OF CELLULARVISION

CellularVision,[1] by its attorneys, hereby files Reply Comments with regard to Comments filed in response to the Notice of Proposed Rulemaking ("NPRM") in the above-referenced proceeding. CellularVision's principals are the pioneers of the CellularVision technology for the Local Multipoint Distribution Service ("LMDS"), which the Commission has proposed to license in the 27.5-29.5 GHz ("28 GHz") band in CC Docket No. 92-297. As CellularVision has documented in that proceeding, this revolutionary and competitive video, voice and data service will generate innumerable and immediate public interest benefits from the robust use of the largely fallow 28

[1] For purposes of this document, references to "CellularVision" include the following related companies which are controlled by common principals: Suite 12 Group, which founded the CellularVision technology for the Local Multipoint Distribution Service in the 27.5-29.5 GHz band and was tentatively awarded a pioneer's preference by the Commission, see Notice of Proposed Rulemaking, Order, Tentative Decision and Order on Reconsideration ("First NPRM"), 8 FCC Rcd 557 (1993), CellularVision Technology and Telecommunications, Inc., which holds the patent for the CellularVision technology, and CellularVision of New York, L.P., which operates a commercial LMDS video service as an alternative to cable television in the New York Primary Metropolitan Statistical Area ("PMSA") in the 27.5-28.5 GHz band pursuant to a commercial license granted by the Commission in 1991. See Hye Crest Management, Inc. ("Hye Crest Order"), 6 FCC Rcd 332 (1991).

GHz band, including potentially billions of dollars for the U.S. Treasury from spectrum auction revenues. If, however, the Commission were to acquiesce to the anti-competitive requests of Fixed Satellite Service ("FSS") proponents in the instant proceeding and banish LMDS to the 40.5-42.5 GHz ("40 GHz") band, LMDS will never develop as an affordable and competitive nationwide alternative to cable and the numerous public interest benefits from LMDS will be lost.

I. LMDS Would Not be Viable at 40 GHz

In view of the Commission's inexplicable and total inaction in CC Docket No. 92-297 since the conclusion of the 28 GHz LMDS/FSS Negotiated Rulemaking in September 1994, and in view of well documented transparent anti-competitive efforts of certain FSS parties to hoard the unused, yet enormously valuable 28 GHz band, CellularVision expected that these FSS interests, led by Hughes and Teledesic, would use the Commission's seemingly innocuous 40 GHz rulemaking to seek to exile LMDS to the unusable 40 GHz band. Accordingly, in its filings in this proceeding and in the LMDS Rulemaking proceeding, CellularVision has demonstrated that:

- The Commission's proposal to license the Local Millimeter Wave Service ("LMWS") in the 40.5-42.5 GHz band cannot be an alternative to licensing LMDS in the 28 GHz band.

- The 40 GHz band represents an economic graveyard for LMDS, since based on differences in signal propagation characteristics, component technology and system implementation, the cost of LMDS at 40 GHz is projected to be roughly 30 to 40 times the cost at 28 GHz, and further due to spectral efficiencies realized at 28 GHz that would be lost at 40 GHz, LMDS would require four times as much spectrum at 40 GHz in

order to be competitive.[2]

- The Commission previously had unequivocally rejected suggestions to license LMDS in the 40 GHz band, concluding in the LMDS 28 GHz Rulemaking record that the public interest benefits anticipated from point-to-multipoint use of the 28 GHz band would not materialize at higher bands.

- The CEPT's proposed Multipoint Video Distribution Service ("MVDS"), which is designed to operate in Northern Europe's climate dominated by drizzle, is a limited capacity (20-32 channels), one-way video service that cannot compete with cable systems; therefore, it is not the equivalent of LMDS currently licensed in the 28 GHz band throughout North and South America, including Canada, Mexico, Brazil, Venezuela, Argentina, Guatemala and, of course, the United States, where it is commercially licensed in the New York PMSA.

- If the FSS interests persist in their stubborn refusal to consider co-frequency sharing of the 28 GHz band with LMDS, forcing the Commission to choose between LMDS and the paper FSS systems for the 28 GHz band, the Commission should note that FSS uplinks proposed

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[2] CellularVision's conclusion that LMDS would not be viable at 40 GHz is consistent with the views of other LMDS system proponents, including Texas Instruments and The University of Texas. See Texas Instruments Comments, dated January 27, 1995. Furthermore, Steve Copold, Director of Information Resources at The University of Texas - Pan American, a respected authority on LMDS who was a member of the LMDS/FSS 28 GHz Negotiated Rulemaking Committee, has repeatedly stated publicly that he strongly believes "that migrating LMDS from the 28 GHz to the 40 GHz band or to any spot above 40 GHz will guarantee that this technology will not be deployed for at least another decade, and if so, at that point, at a cost exponentially greater than current deployment costs of LMDS at the 28 GHz." Mr. Copold has further stated "that an average LMDS cell with a diameter of six miles deployed at 28 GHz will provide a coverage area of approximately 28.3 square miles. An optimistic estimate for similar deployment at the 40 GHz would certainly restrict the cell diameter to one mile or less at the current state of technology. This 40 GHz deployment would yield a subscription coverage area of only .78 square miles, thereby reducing the effective coverage of a 28 GHz system by a factor of nearly 37 to 1." Additionally, according to Mr. Copold, the system would be strictly limited to line of sight service as the reflective characteristics of the signal at or above 40 GHz are so "lossy" that propagation of the signal through passive reflectors would not be practical. Presentation of Steve Copold at February 7, 1995 meeting of Board of Directors of the Hispanic Educational Telecommunications Systems.

for the 28 GHz band are ideally suited for operation in the 40 GHz band, as currently demonstrated by the Department of Defense's operational MILSTAR satellite system, and move the FSS interests to the unused bands above 40 GHz.

- Spectrum auctioning of the 28 GHz band now through the nationwide deployment of LMDS based on existent LMDS technology would immediately generate billions of federal deficit-reducing dollars that otherwise have been lost due to FSS success to date in hoarding the 28 GHz band — a rich and unused resource that belongs to all citizens of the United States, and not only to a few giant, well-connected corporate entities, Hughes Communications Galaxy, Inc. ("Hughes") and Teledesic Corporation ("Teledesic"). Ironically, even if Hughes's and Teledesic's untested paper FSS proposals for the 28 GHz band are put out for public comment and survive harsh scrutiny from the technical and financial communities, they will not generate any spectrum auction revenues for the Federal Treasury even if they are ultimately licensed by the Hundt Commission, which, with the puzzling exception of its failure to proceed with the nationwide deployment of LMDS in the 28 GHz band, has been appropriately vigorous in generating spectrum auction fees wherever possible.

- Only LMDS can provide viable competition to cable and telephone services, and also offer a wide-bandwidth information superhighway directly to the home. Even this highest capacity proposed FSS two-way satellite system, the Teledesic system, could provide simultaneous telephone service to only 0.18% of the population in the densest areas covering 90% of the total U.S. population, and T-1 service to only 0.0018% of this same population of approximately 234 million. By contrast, LMDS can provide simultaneous telephone service to approximately 75-90% of the U.S. population. Thus, two-way satellite service to the home or business is an enormous waste of spectrum.

II. The Few Analyses Submitted by the FSS Interests Claiming to Support the Viability of LMDS at 40 GHz are Incomplete, Misleading and Fatally Flawed

Not surprisingly, the FSS interests, led by Hughes, Teledesic and NASA, filed comments in the instant proceeding informing the Commission of the "win-win" resolution of the 28 GHz LMDS proceeding that can be achieved by moving LMDS to

the 40 GHz band and giving the fallow 28 GHz band exclusively to proposed FSS systems. In order to dupe the Commission into supporting their purported "win-win" scheme, the FSS interests assert that LMDS would be viable at 40 GHz, based on their erroneous claims that LMDS propagation, technical and equipment considerations would be similar at 40 GHz and 28 GHz.[3]

The "technical analyses" provided by Hughes and Teledesic which purport to support their claims about LMDS operation at 40 GHz are fatally flawed in numerous respects and simply ignore reality. As demonstrated by CellularVision's detailed technical review entitled LMDS is Not Viable in the Frequency Bands Above 40 GHz: A Technical Review of Comments Filed in Response to the 40 GHz Notice of Proposed Rulemaking ("Technical Review of 40 GHz Comments") (attached hereto as Appendix 1), the analyses offered by Hughes and Teledesic are subjective and incomplete, and are replete with inaccurate, unsubstantiated and misleading statements and conclusions. Importantly, what the Hughes and Teledesic analyses do demonstrate is that these proponents of would-be untested FSS systems proposed for the 28 GHz band suffer from a severe lack of understanding about LMDS system design and operations, and that they will go to extraordinary lengths in their desperate effort to

[3] Teledesic, for example, claims that since LMDS operation in the 40 GHz band would be "technically comparable" to operation in the 28 GHz band, and the propagation characteristics of LMDS operations in the 40 GHz and 28 GHz bands "are similar," deployment of LMDS in the 40 GHz band instead of the 28 GHz band "will not pose additional technical or economic burdens on LMDS operators." Teledesic Comments, Summary at iii.

push LMDS out of the 28 GHz band.[4]

For example:

- In an attempt to minimize the adverse effects LMDS would face at 40 GHz, Hughes proposes three different options which call for varying degrees of LMDS system modifications, including accepting a slightly lower availability, increase of antenna gain from 10 to 18dB or increasing the receive antenna size from 6.9 to 12 inches. Due to system architecture issues germane to the LMDS multi-cell system, however, these options are totally impractical and reflect a substantial unfamiliarity with the LMDS system design. See Technical Review of 40 GHz Comments, pages 11-12.

- Hughes and NASA also suggest that an LMDS move to 40 GHz would result in a reduction of LMDS system availability from 99.9% at 28 GHz, to 99.84% availability at 40 GHz, a difference which Hughes and NASA label "inconsequential" and "insignificant" respectively. See Hughes Comments, page 6; NASA Comments, page 6. However, the analyses

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[4] For example, Teledesic and its attorneys recently were cited by the Commission's Managing Director for a possible violation of the Commission's ex parte rules. See Letter from Andrew S. Fishel, Managing Director, to Teledesic attorneys, dated February 14, 1995. Compounding Teledesic's apparent disregard for the Commission's ex parte rules, Teledesic's February 24, 1995 response to the Managing Director seeking to explain its conduct reveals an apparent disingenuous practice of making inconsistent legal arguments to the Commission and to the U.S. Court of Appeals. Specifically, in an effort to exculpate itself of the apparent ex parte violation at the Commission, Teledesic's lawyers argued to the Commission that its application is not subject to the ex parte rules because the 451 LMDS waiver applications which the Commission apparently believes may be mutually exclusive with Teledesic's application were dismissed by the FCC in December 1992 as "patently defective" and should not be "accord[ed] any status." Notarized Statement of Teledesic Corporation, dated February 24, 1995, pages 4-5 (emphasis in original). By contrast, just two weeks earlier, on February 10, 1995, in a filing before the U.S. Court of Appeals for the D.C. Circuit, Teledesic contradicted its February 24 sworn statement to the Commission and argued that the mutual exclusivity between those very same 451 LMDS waiver applications and Teledesic's application provided the basis for Teledesic's intervention into a judicial mandamus proceeding involving CellularVision of New York, L.P.'s ("CVNY") 34 pending transmitter applications to expand its commercially licensed LMDS service in the New York PMSA. See Motion for Leave to Intervene filed by Teledesic, CellularVision of New York, L.P. v. FCC, Case No. 95-1030, dated February 10, 1995.

of Hughes and NASA are flawed due to improper assumptions about transmitter power and antenna gains. See Technical Review of 40 GHz Comments, page 10. Also, comparisons to the irrelevant 40 GHz MVDS in CEPT countries is misplaced, as is the FSS treatment of LMDS availability as merely a video/entertainment service issue — LMDS is a primary alternative in the local loop for voice and data services as well. See Id., page 10. Due to the broad range of services offered by LMDS, Hughes's comparison to the 99.7 availability to the video-only, one-way, non-interactive DBS also is not valid. See id., page 10.

- Teledesic's suggestion that moving LMDS to 40 GHz would reduce LMDS system availability from 99.9% to 99.75% is similarly flawed, since it is based on invalid assumptions regarding transmitter power, transmitter antenna gain, receiver antenna gain, noise figure, and a failure to use the Crane/Global rain model (the recommended form for use by system designers, according to NASA). See id., page 13.[5]

- In attempting to create the illusion that LMDS would be viable at 40 GHz, Teledesic selectively reproduces a table from a U.K. Radiocommunications Agency ("UKRA") report comparing link budgets for sector versus omni-directional systems. Teledesic, however, disingenuously eliminated an entire column from the UKRA table which provided a link budget for an omni-directional system — apparently because the data provided in the omni-directional column that Teledesic omitted bears a striking resemblance to the link budget in CellularVision's comments and supports CellularVision's position that LMDS at 40 GHz would not be viable in the U.S. Additionally, Teledesic omitted a number of other relevant facts in its use of the UKRA table and its accompanying discussion in order to support its misleading and unrealistic view about the viability of LMDS at 40 GHz. See Technical Review of 40 GHz Comments, pages 13-16.

- Teledesic's analysis regarding the potential cost of LMDS equipment at 40 GHz reflects a lack of understanding of the LMDS system and market. Teledesic's analysis uses a receiver with a dual-downconversion scheme with two local oscillators. However, it is commonly recognized in the LMDS industry that operation with a single local oscillator is the

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[5] Notably, Teledesic believes that LMDS should accept only 99.75% system availability, while for its paper FSS systems it claims a 99.9% availability. See Teledesic Application for a Low Earth Orbit Satellite System in the Fixed Satellite Service ("Teledesic Application"), March 21, 1994, Section D — System Description, p. 41.

attractive, practical way to minimize cost. Id., page 13. Thus, Teledesic's conclusions regarding the potential cost of 41 GHz LMDS components are fatally flawed. See id., p. 13.

In addition to the flawed analyses presented by Hughes and Teledesic, several FSS interests filed letters or comments generally advocating the FSS credo of moving LMDS to the 40 GHz band; however, none of these parties provided any analysis to support their conclusory claims about the viability of LMDS systems at 40 GHz. These commenters, who include NASA, GE American Communications, Martin Marietta Space Group and Rockwell International Corp., apparently share Hughes's and Teledesic's common goal of hoarding spectrum for satellite interests at any cost to U.S. consumers. The failure of these parties to provide any technical support for their conclusory claims renders their filings generally worthless.[6] The Commission should discount the incomplete and unsupported assertions of these FSS parties, who are so well coordinated and vocal in advocating that the Commission move LMDS to the 40 GHz band, yet have not supported their empty assertions with independent

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[6] NASA, for example, states that "[a]n examination of the design of a leading contender for LMDS [footnote omitted] [Suite 12] proves conclusively that there is virtually no difference in the operation of LMDS at the higher frequency." NASA Comments, page 5. Incredibly, however, NASA fails to provide the Commission and interested parties with any details regarding its "examination" which it claims was so "conclusiv[e]" about LMDS at 40 GHz. Martin Marietta bootstraps on NASA's failure, as it feebly supports its claim that LMDS should be moved to 40 GHz by stating, "We understand that NASA has determined that there are no technical barriers to LMDS operating across the full 2 GHz of band at 40 GHz." Martin Marietta Letter, page 1. NASA's findings, as discussed herein, are wrong, and thus Martin Marietta's NASA-allied letter merely echoes misinformation about the viability of LMDS at 40 GHz. Likewise, GE American, without offering any details, merely states that it "believes LMDS is capable of using the 40 GHz band without detriment to the provision of LMDS." GE American Comments, page 5.

technical analyses which are a fundamental prerequisite to determining whether LMDS would be viable at 40 GHz band.

The FSS interests apparently recruited one convert from the Mobile Satellite Service ("MSS") community, as MSS applicant TRW, Inc. joined their cause by filing Comments that are notable for several bold, unsupported and incorrect assertions about the viability of LMDS at 40 GHz. For example, TRW states "with conviction that the technology that would drive LMDS at 28 GHz is not only available for 40 GHz, there is no appreciable cost difference." TRW Comments, pages 7-8. Apparently TRW believes that a record based on its "conviction" alone is sufficient factual evidence to support a Commission decision, since TRW failed to provide any information or analysis to support this radical statement. TRW then takes another step away from reality when it declares that "the spectrum [40 GHz] is in fact superior to the currently-proposed 28 GHz band segment for this type of service [LMDS]." Id., page 9. If any of these assertions were true, LMDS proponents would welcome a move to spectrum where the nationwide licensing of LMDS could finally take place.

In view of the absence of any accurate, credible technical analysis supporting the viability of LMDS at 40 GHz, the FSS interests simply have failed to develop the type of thorough and credible administrative record upon which a judicially sustainable Commission decision could be made to move LMDS to the 40 GHz band, as to do so represents such a radical, arbitrary and unsupported departure from numerous prior Commission decisions regarding the appropriate deployment of LMDS in the 28 GHz

band.[7]

Finally, one assertion made by GE American is extremely illuminating regarding the flawed record that the satellite interests make in support of a Commission reversal of its previously well-documented record in support of licensing LMDS nationwide in the 28 GHz band. GE American argues that by using the instant proceeding to license LMDS in the 40 GHz band now, the Commission would not necessarily be foreclosing its intention that the band be available for use by undefined future technologies. Why? As GE American states:

> [T]here is no reason to conclude that imaginative new technology developers can not design their products so as to operate on an interference-free basis with LMDS at 40 GHz.

GE American Comments, page 6. While CellularVision heartily agrees with GE American on this point, it is instructive to note from the NRMC record that when GE American was a member of the 28 GHz LMDS Negotiated Rulemaking, GE American,

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[7] Equally defective are the claims of point-to-point microwave proponents Harris Corporation-Farinon Division ("Harris"), Telecommunications Industry Association ("TIA") and Alcatel Network Systems, Inc. ("Alcatel") that LMDS should be moved to the 40 GHz band so that the 28 GHz band may be preserved for point-to-point microwave use. Harris cites "ITU-R Recommendation 748" for the proposition that the 40 GHz band has been recognized by the ITU . . . as a band well suited for LMDS . . ." Harris Letter, dated January 30, 1995, page 2. However, CCIR Recommendation 748 (revised March 8, 1992) and Draft Revision of Recommendation ITU-R F.748-1 (Document 9/22-E, November 21, 1994) do not appear to address the 40 GHz band, instead focusing only on the 28 GHz band. In any case, the effort of the point-to-point microwave proponents to push LMDS to the 40 GHz band must be rejected, since as discussed herein, LMDS would not be viable at 40 GHz. However, since the 40 GHz band is well-suited to point-to-point microwave system architecture, as is evident by the requests of TIA and Alcatel for additional spectrum in the bands above 40 GHz, the Commission should allow such operations in the bands above 40 GHz, but not at the expense of the appropriate deployment of LMDS in the 28 GHz band.

along with Hughes, Teledesic and other FSS parties, steadfastly refused to discuss even minor changes in various FSS system designs that could mitigate possible interference that the proposed FSS systems would cause to LMDS systems. Had the FSS members of the NRMC genuinely been interested in pursuing an LMDS/FSS co-frequency sharing approach, certainly those same "imaginative new technology developers" recognized by GE American could have examined the proposed 28 GHz FSS systems of Hughes and Teledesic, which are only "paper" proposals, years away from deployment, to determine the extent to which changes in design could have mitigated FSS-caused interference and allowed the services to co-exist on a primary basis in the 28 GHz band.[8]

As the NRMC record amply documents, for the FSS interests, minor adjustments or changes in system design are taboo even when, in the opinion of such a technically proficient and respected third party as Bellcore, such modifications could make the robust co-primary frequency sharing of the 28 GHz band between LMDS and

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[8] Despite the FSS interests' vehement opposition to any reexamination of their system designs in an effort to facilitate co-frequency sharing, other members of the NRMC have continued to study that issue. Initially, as part of the NRMC's Report, Bell Communications Research, Inc. ("Bellcore") submitted a preliminary study which concluded that certain minimal changes in FSS antenna design could substantially mitigate FSS-caused interference. See Interference from FSS Uplinks into LMDS Receivers: The Impact of Improved Antenna Patterns, prepared by Bellcore, submitted as an Addenda to Report of the LMDS/FSS 28 GHz Negotiated Rulemaking Committee, dated September 23, 1994. Additionally, a consortium of industry leaders recently commissioned Bellcore to conduct further research into this issue in order to develop a framework for co-frequency sharing of the 28 GHz band between LMDS and proposed FSS systems. Members of this diverse consortium include Bell Atlantic, Motorola Satellite Communications, Inc., CellularVision of New York, L.P., Texas Instruments, Philips Electronics North America Corporation, RioVision, Titan Information Systems and The International CellularVision Association.

FSS feasible. The Commission must recognize that unlike the cooperative efforts of Motorola Satellite Communications, Inc., an MSS interest, and LMDS interests who agreed on a co-frequency sharing approach, the blatant refusal by Hughes, Teledesic and other FSS interests in the NRMC to seriously work towards an LMDS/FSS co-frequency sharing approach eliminated any possibility of achieving a consensus on such an approach. The regrettable lack of consensus that was engineered by FSS interests is a victory for the well-connected satellite interests whose underlying anti-competitive goals, as stated again and again by numerous parties in the LMDS Rulemaking record, is to crush the broadband competition that LMDS is poised to provide, and to preserve their exclusive hold over the 28 GHz spectrum free of charge.[9]

III. The Proposed 40 GHz MVDS in CEPT Countries is Not the Equivalent of American 28 GHz LMDS

The FSS interests repeated and disingenuous citations to the recommendation of the Conference on European Posts and Telecommunications ("CEPT") to use the 40 GHz band for the proposed Multipoint Video Distribution System ("MVDS") as a basis for moving LMDS in the U.S. to 40 GHz is intellectually vacant. In the U.S., LMDS in the 28 GHz band is intended to be a broadband service capable of offering

[9] Based on the United States Table of Frequency Allocations, the FSS has been allocated over 100 GHz of spectrum between 3600 MHz and 275 GHz, including approximately 22.65 GHz below 50.2 GHz — an enormous amount of spectrum which is available for FSS use without the payment of spectrum auction fees. See 47 C.F.R. § 2.106 (1993).

an array of competitive two-way video, voice and data services. By contrast, as the limited record confirms, 40 GHz MVDS is envisioned by CEPT countries as a limited capacity (20-32 channels), one-way video service that, in today's marketplace, will not offer competition to cable.

The limitations of 40 GHz MVDS in CEPT countries and the resulting irrelevance of MVDS to U.S. 28 GHz LMDS is evident from the statements of the CEPT dating back to 1990. In recommending the 40 GHz band for MVDS, the CEPT recognized that typical systems would transmit a "large number of channels (typically 20) . . . [and] in some countries MVDS is regarded as an alternative to cable television distribution networks, in others it is considered an extension to those networks." CEPT Recommendation T/R 52-01 E, 1990. Clearly, the CEPT realized as early as 1990 that 20 channels of video would not constitute an alternative to cable in many countries. Today, with the expansion of cable system channel capacity and the deployment of 150+ channel DBS systems, it is even more apparent that a 20-channel system is not a viable cable alternative.[10]

Furthermore, the CEPT acknowledged that the use of the 40 GHz band for

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[10] In comparing MVDS and cable, the U.K. Radiocommunications Agency's 40 GHz MVDS Working Group stated that "MVDS would need to deliver at least 25-30 channels to be seen as a real alternative to cable . . . [and] would also need to be competitive with direct-to-home satellite services both in terms of the numbers of channels that could be delivered and in the price of domestic receivers." Multipoint Video Distribution Systems, Report of the 40 GHz MVDS Working Group, Radiocommunications Agency, November 1993, page 5. Since DBS currently offers about five times as many channels as a proposed 25-30 channel MVDS system, by the 40 GHz MVDS Working Group's own admission, MVDS cannot compete with cable.

MVDS would involve specific technical problems, including limited coverage range, and thus noted "that in some countries there is a need to use substantially lower frequency bands for systems which have to provide a much wider coverage." Id. [11] Accordingly, in examining the 29 GHz, 38 GHz, 42 GHz and 60 GHz bands, the CEPT explicitly recognized that the 29 GHz band "offers the highest performance." Id.

While we are aware of no commercially operating 40 GHz MVDS systems, the proposed Eurobell video delivery system in the United Kingdom referenced by some of the FSS interests in their comments is illustrative of the limitations of the proposed 40 GHz MVDS in CEPT countries. As discussed in CellularVision's Technical Review of 40 GHz Comments, of the 93,000 homes in the Eurobell franchise area, Eurobell proposes in its 1994 application to serve the bulk of its customers with a hybrid fiber/coaxial cable delivery system. See Technical Review of 40 GHz Comments, page 19. Eurobell proposes to service only about 20 percent, or 19,000 homes, with a one-way, local MVDS system that will be independent of its fiber/coaxial cable system. Id. In addition, Eurobell's application is for a "technologically neutral

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[11] In view of the severe effect of rainfall on signal propagation in the 40 GHz band and the resulting constraints on system geometry, even the CEPT recognized that 40 GHz MVDS was based on rainfall attenuation statistics valid for only a limited portion of Western Europe, and that the perceived technical and economic viability of 40 GHz MVDS in at least part of Europe could not be extended to continental and subtropical climate zones, such as the U.S. See CellularVision Comments, Appendix 2, LMDS is Not Viable in the Frequency Bands Above 40 GHz, pages 15-16. Thus, in Northern Europe, with a climate dominated by drizzle, the differences between operating at 40 GHz versus 28 GHz may be economically acceptable for the limited scope MVDS service contemplated; by contrast, in continental and subtropical climate zones, the penalty would be so severe that it would jeopardize the viability of the system. Id.

franchise license," which provides Eurobell with the flexibility that the U.K.'s Radiocommunications Agency apparently recognized was necessary given the unproven nature and limitations of 40 GHz MVDS. Instead of representing the robust deployment of 40 GHz MVDS, Eurobell is an example of the severely limited and unproven nature of this proposed service.

The unsupported statement of Hughes that "a number of manufacturers have indicated their ability to provide the necessary 40 GHz transmitters, receivers, and antennas for MVDS" (Hughes Comments, page 14) is directly contradicted by the U.K. Radiocommunications Agency's 40 GHz MVDS Working Group, which stated that "the development of MVDS is still very much in its infancy . . . [and] it should be borne in mind that a number of pieces of equipment needed for MVDS operations are still at the developmental stage." Multipoint Video Distribution Systems, Report of the 40 GHz MVDS Working Group, Radiocommunications Agency, November 1993, page 12.

IV. LMDS is Proven in the 28 GHz Band, as Numerous Countries Throughout the World are Recognizing by Licensing LMDS at 28 GHz

The FSS interests' persistent conclusory reliance on "European 40 GHz MVDS" as the basis for a global standard not only ignores the severe technical and propagation constraints of LMDS at 40 GHz in most climates of the world, but it also is a smokescreen to obfuscate the significant trend throughout the world in licensing LMDS in the 28 GHz band. The limitations and singular, unproven case of the CEPT's proposed 40 GHz MVDS have been well documented, and the fact that the 40 GHz MVDS in certain European countries would not be the equivalent of LMDS is now well

established in the record.

As a result, numerous countries are following the lead that the Commission first took in 1991 when it commercially licensed LMDS in the 27.5-28.5 GHz band in the New York PMSA.[12] In addition to the United States, countries throughout North and South America have issued licenses for LMDS in the 28 GHz band including Canada, Mexico, Brazil, Venezuela, Argentina and Guatemala.[13]

The Commission's early leadership in licensing LMDS in the 28 GHz band is being followed by numerous other countries, particularly in the Western Hemisphere where NAFTA's early influence portends an enormous export potential for the U.S.-developed LMDS technology. Today, following through on the vision of prior Commissions in commercially licensing LMDS in the New York PMSA and granting numerous 28 GHz LMDS experimental licenses, the Hundt Commission has an ideal opportunity to play a leadership role in promoting the competitive and affordable LMDS wireless technology here and abroad as part of the NII and the GII. Given its diverse service offerings and its low cost, wireless infrastructure, LMDS has an immediate application globally, and particularly in the developing world, in sharp

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[12] See Hye Crest Order, supra, note 1.

[13] In addition to these countries, CellularVision currently is in final negotiations with entrepreneurial groups in nine addition countries in various regions of the world, who are expected to announce their plans in the near-term to utilize the 28 GHz band for LMDS. CellularVision also is in negotiations with groups in 17 additional countries, where the promise of LMDS in the 28 GHz band has led to serious ongoing discussions. Obviously, for commercial reasons and consistent with confidentiality agreements, the parties to these negotiations and the countries involved cannot be disclosed until formal announcements are made.

contrast to the costly, elite services proposed by the unproven, paper systems of Hughes and Teledesic which at best are years away from deployment.

Based on the proven commercial and educational application of LMDS in the 28 GHz band, it would be particularly irresponsible and arbitrary for the Commission to blindly follow the untested approach being taken by CEPT officials who contemplate an entirely different type of system under an extremely climate-specific situation. Instead of following the purported 40 GHz standard for LMDS that would destroy its populist application in the U.S. and throughout the Western Hemisphere and the globe, the Hundt Commission should reject the irrelevant CEPT approach to its limited version of LMDS, just like U.S. interests rejected the flawed HDTV standard initially proposed by European and Japanese interests. Continued U.S. leadership in the global communications marketplace requires enlightened, confident and prompt Commission licensing of LMDS nationwide in the 28 GHz band.

V. FSS Systems are Ideally Suited for the 40 GHz Band

If the FSS interests continue to reject co-frequency sharing of the 28 GHz band and insist on forcing the Commission to choose either LMDS or the proposed FSS systems, the logical solution is not the FSS-inspired exile of LMDS to the unviable 40 GHz band, but rather the allocation to FSS of spectrum above 40 GHz, where the viability for FSS is already proven.[14]

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[14] GE American seeks to create the opposite impression, when it claims that the difference in signal attenuation at 40 GHz versus 28 GHz caused "particularly by rain" is "not major" for LMDS, "in comparison to the suboptimal use of the 40 GHz band

In its earlier Comments in this proceeding, CellularVision confirmed that since the propagation effects that impact the 40 GHz band are most severe at low altitudes over the horizontal paths over which LMDS operates, FSS systems, which operate on slant paths which may approach zenith, are much more likely to be operated successfully in the 40 GHz band than LMDS systems. See CellularVision Comments, pages 8-9. CellularVision further explained that the MILSTAR system, which is operational with uplinks in the 44 GHz band, and downlinks in the 20 GHz band, has proven the viability of FSS uplinks in the bands above 40 GHz. Id., Appendix 2, LMDS is Not Viable in the Frequency Bands Above 40 GHz, pages 19-21.

In the attached Technical Review of 40 GHz Comments, CellularVision again reiterates that FSS uplinks are ideal candidates for use of the bands above 40 GHz. Teledesic's paper FSS system, for example, has such large excess power margins that would easily allow it to operate its uplinks above 40 GHz. See Technical Review of 40 GHz Comments, pages 26-27.

VI. The Public Interest Mandates that the Commission Deploy LMDS Nationwide in the 28 GHz Band, Not in the 40 GHz Band

While the LMDS Rulemaking has been unreasonably stalled for months, denying

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for satellites, with their significantly longer . . . transmission paths through hundreds of thousands of miles through the atmosphere . . ." GE American Comments, page 7. GE American's comparison makes no sense. If, as GE American recognizes, rain attenuation is the main propagation concern at 40 GHz, then the satellite communications path through rain is only a few miles, certainly not "hundreds of thousands of miles" as claimed by GE American. See Technical Review of 40 GHz Comments, pages 25-26.

non-profit groups, educational institutions and other consumer interests a full opportunity to address the public interest benefits of LMDS, CellularVision previously provided detailed filings in the record which document some of the countless public interest benefits that will be realized from the nationwide deployment of LMDS in the 28 GHz band:

- LMDS will provide consumers with an array of competitive interactive video, voice and data services;
- LMDS is a high quality, low cost alternative to cable television;
- LMDS systems will be owned and operated by women, minorities and small businesses;
- LMDS will be available to consumers regardless of social or economic class, who will enjoy numerous affordable benefits from this competitive technology;
- LMDS will create jobs for U.S. workers in the areas of LMDS system operations as well as in equipment manufacturing, particularly in the defense sector;
- LMDS will create a valuable export technology for the U.S. to be utilized in both developed and developing markets throughout the world;
- LMDS will produce billions of deficit-reducing dollars for the U.S. Treasury through spectrum auctions of LMDS licenses.

Additionally, the United States Small Business Administration ("SBA"), a tenacious and articulate representative of the Clinton Administration on matters of importance to small business in this country, recently reiterated its opinion in the LMDS Rulemaking proceeding that if the Commission is forced to make a choice between LMDS and satellite services, that terrestrial-based services in the 28 GHz band will best promote the public interest since such services would increase the

opportunities for small business providers and generally offer greater benefits to small business users. See Comments of the Chief Counsel for Advocacy of the United States Small Business Administration in Support of the Motion to Proceed by CellularVision ("SBA Comments"), CC Docket No. 92-297, filed February 14, 1995; see also Comments of the Chief Counsel for Advocacy of the Small Business Administration on the Second NPRM, CC Docket No. 92-297, filed March, 28, 1994, page 2. In its February 14, 1995 Comments, the SBA recognized the numerous significant public interests to be advanced by the deployment of LMDS in the 28 GHz band, including LMDS's role as high quality competition to cable systems, LMDS's unique ability "to offer diverse services within the metropolitan region," LMDS's affordability, which will allow "a wide diversity of parties to participate in the multichannel telecommunications revolution," [15] and LMDS's role as "a relatively inexpensive technology that can bring distant learning on multiple channels to rural classrooms." SBA Comments, February 14, 1995, pages 4-5.

In sum, the SBA recognizes that "many more benefits arise from terrestrial use of the 28 GHz band or some mechanism for FSS to share service with terrestrial users." Id., page 7.[16] Accordingly, the SBA urges the Commission to conduct "a

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[15] As the SBA appropriately recognizes, "[t]he relative low-cost [of LMDS systems] would enable groups generally underrepresented in the ownership of mass media properties to obtain such properties." SBA Comments, February 14, 1995, page 5. In this regard, the SBA noted that the Commission recently commenced a series of related rulemaking proceedings designed to find ways to increase the ownership of media properties by women and minorities. See id.

[16] The SBA astutely recognizes that "one potential FSS user [Teledesic] proposes a pie-in-the-sky project that may or may not get off the ground," while